METHODS, SYSTEMS AND COMPUTER PROGRAM PRODUCTS FOR COMMUNICATING PRODUCT STATUS INFORMATION

Field of the Invention

The present invention relates to information systems and more particularly

5   to product status information systems.

Background of the Invention

Information Technology (IT) systems, methods and computer program

products, including, for example, computer networks, have grown increasingly

10   commonplace, both in the business and home environment. These systems are

generally able to communicate using protocols, such as the Internet Protocol (IP)

over a shared infrastructure with registered addresses referred to as the Internet

and/or the world wide web. The spread of these communicatively coupled systems

provides a channel for communication of information to both businesses and

15   consumers that was previously unknown. In addition to acting as a news

distribution channel, the Internet is being used for sales and marketing of a wide

range of consumer products and services. In addition, the Internet is increasingly

being used for registration of such products with the manufacturer and/or

distributor of the product, particularly for software products that may be distributed

20   to the consumer electronically over the Internet itself.

Products are typically sold to consumers in packing including a universal

product code (UPC) bar code label. These UPC labels are commonly used, for

example, at retail checkout points to determine the price of the product. The UPC label is an identifier associated with a product type and/or model. For example, all of the cartons for a particular brand and model of a television from a manufacturer will generally be placed in packaging having the same UPC label.

5   Additional uses for the UPC label in connection with cooking devices are described in United States Patent No. 5,426,280 ("the '280 patent"). The '208 patent describes a microwave oven including a sensor to read a UPC bar code that identifies the food or food product being placed in the microwave oven. Based on the read UPC bar code, the microwave oven may activate the microwave cooking

10   cycle based on a particular cooking program that is identified by the UPC bar code information.

One area of concern with consumer products is safety. If a manufacturer determines that products are defective, it may issue a recall for the affected products if the defect poses a safety risk to the consumer. One category of

15   products where this is particularly common is with food products. The manufacturers typically identify the products affected by a batch number. A batch number may represent a particular day and/or shift of production of the product and/or may be associated with a particular batch of supplies used in producing the products. Notification of a recall is typically provided to the consumer by mass

20   market communications (television and print news media) and/or by mailing of notification of the recall to consumers who have registered their purchased product by submitting identifying personal information to the manufacturer, for example, on a mailed product registration card or electronically over the Internet.

An alternative approach to notifying a consumer that a food product is

25   defective is proposed in United States Patent No. 5,869,341 ("the '341 patent"). As described in the '341 patent, a food contamination detector is provided by a special substrate on a bar code label attached to the product that renders the bar code label unreadable if the product is contaminated. A substrate reactive with food contaminants is required to provide the change in color affecting the ability to

30   read the bar code label and the substrate is placed in contact with food juices from the product.

It has also been proposed to use a bar code label in connection with a
microwave oven to detect ingredients of a product placed in the microwave oven in
addition to cooking time for the product. For example, ingredients to which the
consumer is allergic or which the consumer wishes to avoid eating, such as meat,
5   may be determined based on the bar code information.

Summary of the Invention

Embodiments of the present invention provide methods, systems and
10   computer program products for communicating product status information
including maintaining a record of a product identification string associated with a
product of a user. The product identification string is associated with a
corresponding batch of the product. A batch status request is transmitted to a
directory service maintaining batch status information at selected intervals and/or
15   responsive to a user request. The requested batch status information for the
product is then received. The batch status request may include no personal
information of the user.

In some embodiments of the present invention, the method further includes
scanning a product label of the product to obtain the product identification string.
20   The batch status request may be transmitted responsive to scanning of the product
label. The record may only be maintained as a temporary record of the product
identification string while transmitting the batch status request. The received batch
status information may be communicated to the user. The batch status information
may, for example, indicate a recall of the product and the user may be notified of
25   the recall.

In other embodiments of the present invention, a plurality of records of
product identification strings associated with a plurality of products of the user are
maintained. The user may be registered with a trusted entity and batch status
requests for the plurality of products may be transmitted to the trusted entity and
30   the requested batch status information may be received from the trusted entity. The
received batch status information may include a certification of the trusted entity

and/or a signature of an inspecting authority generating the batch status information.

In further embodiments of the present invention, batch status requests for different ones of the products are transmitted to different entities and the requested batch status information is received for respective products from the different entities. The received batch status information may include a certification of the different entities and/or a signature of an inspecting authority generating the batch status information.

In some embodiments of the present invention, the product label is scanned using a consumer appliance. The consumer appliance may be a cooking appliance. A record of recalled products may be maintained at the cooking appliance and a product label may be scanned if a user attempts to cook the product in the cooking appliance. The user of the cooking appliance may then be notified of a recall if the user attempts to cook a recalled product in the cooking appliance. In some embodiments of the present invention, the consumer appliance is a food storage appliance and the user if notified if the batch status information indicates a recall of the product if the user attempts to store the product in the food storage appliance. The consumer product may also be an information appliance.

In other embodiments of the present invention, a plurality of machine readable labels associated with the products of the user are scanned at a purchase location. A sales receipt is generated that includes a machine readable label configured to allow retrieval of the product identification strings for the scanned plurality of machine readable labels. The machine readable label of the sales receipt may then be scanned to obtain the product identification strings for the scanned plurality of machine readable labels.

In further embodiments of the present invention, a user brand loyalty card and/or bank card is scanned at a purchase location. A plurality of machine readable labels associated with the products of the user is also scanned at a purchase location. The product identification strings for the scanned plurality of machine readable labels are associated with the scanned user brand loyalty card and/or bank card to allow retrieval of the product identification strings for the

scanned plurality of machine readable labels. The user brand loyalty card may then be scanned to obtain the product identification strings for the scanned plurality of machine readable labels and/or the product identification strings for the scanned plurality of machine readable labels may be obtained from a provider of the bank

5   card.

In other embodiments of the present invention, methods are provided for communicating product status information including receiving from a requestor a batch status request including a product identification string associated with a product of a user. The product identification string is associated with a

10   corresponding batch of the product and includes no personal information of the user. A directory service including a plurality of records associating product identification strings with batch identifications for corresponding products is queried to obtain the requested batch status information. A product type has a plurality of associated product identification strings associated with different

15   batches of the product type and the corresponding products are provided with a machine readable label including an associated one of the product identification strings. The obtained batch status information for the product is transmitted to the requestor.

In further embodiments of the present invention, consumer appliances are

20   provided including a scanner configured to obtain a product identification string from a product and a controller configured to determine batch status information for a scanned product based on the obtained product identification string. The controller may be configured to repeatedly verify batch status information for a scanned product. The consumer appliance may include a database including a

25   plurality of records of product identification strings associated with a plurality of products of the user and the controller may be configured to determine batch status information for the plurality of products of the user based on the product identification strings.

In other embodiments of the present invention, directory services are

30   provided including a plurality of records associating product identification strings with batch identifications for corresponding products. A product type has a

plurality of associated product identification strings associated with different batches of the product type and the corresponding products are provided with a machine readable label including an associated one of the product identification strings. The product identification strings may be bar code values and the machine

5   readable labels may be bar code labels. The records may further include status information associated with the different batches and the directory service may includean input interface configured to receive a batch status request from a user and to provide the status information to the user responsive to the received batch status request. The directory service may include records for products from

10   different vendors or only records associated with products of a single vendor.

     In further embodiments of the present invention, methods of communicating product status information include obtaining a product identification string of a product of a user. The product identification string is associated with a plurality of batches, one of which is associated with the product.

15   A batch status request including the obtained product identification string is transmitted to a directory service maintaining batch status information. The requested batch status information for the product is received. The received batch status information includes information associated with the plurality of batches. The user is notified of received batch status information for respective ones of the

20   plurality of batches.

     As will further be appreciated by those of skill in the art, while described above primarily with reference to method aspects, the present invention may be embodied as methods, apparatus/systems and/or computer program products.

25   Brief Description of the Drawings

     Figure 1 is a block diagram of a data processing system suitable for use in a system according to some embodiments of the present invention;

     Figure 2 is a more detailed block diagram of a consumer appliance system for communicating product status information according to some embodiments of

30   the present invention;

Figure 3 is a more detailed block diagram of a directory service system for communicating product status information according to some embodiments of the present invention;

Figure 4 is a flowchart illustrating operations for communicating product
5   status information according to some embodiments of the present invention;

Figure 5 is a flowchart illustrating operations for communicating recall information using a consumer appliance according to some embodiments of the present invention;

Figure 6 is a flowchart illustrating operations for communicating product
10   status information using labeled sales receipts according to some embodiments of the present invention;

Figure 7 is a flowchart illustrating operations for communicating product status information using brand loyalty cards and/or bank cards according to some embodiments of the present invention; and

15   **Figure 8** is a flowchart illustrating operations for communicating product status information using a directory service according to some embodiments of the present invention.

Detailed Description of the Invention

20   The present invention now will be described more fully hereinafter with reference to the accompanying drawings, in which illustrative embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and
25   complete, and will fully convey the scope of the invention to those skilled in the art. Like numbers refer to like elements throughout.

As will be appreciated by one of skill in the art, the present invention may be embodied as a method, data processing system, or computer program product. Accordingly, the present invention may take the form of an entirely hardware
30   embodiment, an entirely software embodiment or an embodiment combining software and hardware aspects all generally referred to herein as a "circuit" or

"module." Furthermore, the present invention may take the form of a computer program product on a computer-usable storage medium having computer-usable program code embodied in the medium. Any suitable computer readable medium may be utilized including hard disks, CD-ROMs, optical storage devices, a

5   transmission media such as those supporting the Internet or an intranet, or magnetic storage devices.

Computer program code for carrying out operations of the present invention may be written in an object oriented programming language such as Java®, Smalltalk or C++. However, the computer program code for carrying out

10   operations of the present invention may also be written in conventional procedural programming languages, such as the "C" programming language. The program code may execute entirely on the user's computer, partly on the user's computer, as a stand-alone software package, partly on the user's computer and partly on a remote computer or entirely on the remote computer. In the latter scenario, the

15   remote computer may be connected to the user's computer through a local area network (LAN) or a wide area network (WAN), or the connection may be made to an external computer (for example, through the Internet using an Internet Service Provider).

The present invention is described below with reference to flowchart

20   illustrations and/or block diagrams of methods, apparatus (systems) and computer program products according to embodiments of the invention. It will be understood that each block of the flowchart illustrations and/or block diagrams, and combinations of blocks in the flowchart illustrations and/or block diagrams, can be implemented by computer program instructions. These computer program

25   instructions may be provided to a processor of a general purpose computer, special purpose computer, or other programmable data processing apparatus to produce a machine, such that the instructions, which execute via the processor of the computer or other programmable data processing apparatus, create means for implementing the functions/acts specified in the flowchart and/or block diagram

30   block or blocks.

These computer program instructions may also be stored in a computer-readable memory that can direct a computer or other programmable data processing apparatus to function in a particular manner, such that the instructions stored in the computer-readable memory produce an article of manufacture including instruction

5   means which implement the function/act specified in the flowchart and/or block diagram block or blocks.

The computer program instructions may also be loaded onto a computer or other programmable data processing apparatus to cause a series of operational steps to be performed on the computer or other programmable apparatus to produce a

10   computer implemented process such that the instructions which execute on the computer or other programmable apparatus provide steps for implementing the functions/acts specified in the flowchart and/or block diagram block or blocks.

Various embodiments of the present invention will now be described with reference to the figures. **Figure 1** illustrates an exemplary embodiment of a data

15   processing system **30** suitable for communication of product status information in accordance with some embodiments of the present invention. The data processing system **30** may typically include input device(s) **32** such as an optical or radio frequency receiver (scanner), keyboard or keypad, a display **34**, and a memory **36** that communicate with a processor **38**. The data processing system **30** may further

20   include a speaker **44** or other output device for notifying a consumer of a recall, and an I/O data port(s) **46**, for example, an Ethernet or other interface supporting an Internet connection to send and/or receive batch status information or requests for the same, that also communicate with the processor **38**. The I/O data ports **46** can be used to transfer information between the data processing system **30** and

25   another computer system or a network. These components may be conventional components, such as those used in many conventional data processing systems, which may be configured to operate as described herein. While notifying a user of a recall or other status information is described above with reference to a speaker **44** or other output device of the illustrated system **30**, it is to be understood that

30   alternate contact information may be used, for example, calling a user's home or mobile telephone number.

Figure 2 is a block diagram of data processing systems that illustrate consumer appliance systems, methods, and computer program products for communicating product status information in accordance with some embodiments of the present invention. The processor 238 communicates with the memory 236

5   via an address/data bus 205. The processor 38 can be any commercially available or custom microprocessor. The memory 236 is representative of the overall hierarchy of memory devices containing the software and data used to implement the functionality of the data processing system 200. The memory 236 can include, but is not limited to, the following types of devices: cache, ROM, PROM,

10   EPROM, EEPROM, flash memory, SRAM, and DRAM.

As shown in Figure 2, the memory 236 may include several categories of software and data used in the data processing system 200: the operating system 252; the application programs 254; the input/output (I/O) device drivers 258; and the data 256. As will be appreciated by those of skill in the art, the operating

15   system 252 may be any operating system suitable for use with a data processing system, such as OS/2, AIX or System390 from International Business Machines Corporation, Armonk, NY, Windows95, Windows98, Windows2000 or WindowsXP from Microsoft Corporation, Redmond, WA, Unix or Linux. The I/O device drivers 258 typically include software routines accessed through the

20   operating system 252 by the application programs 254 to communicate with devices such as the I/O data port(s) 46 and certain memory 236 components. The application programs 254 are illustrative of the programs that implement the various features of the data processing system 200 and preferably include at least one application which supports operations according to embodiments of the present

25   invention. Finally, the data 256 represents the static and dynamic data used by the application programs 254, the operating system 252, the I/O device drivers 258, and other software programs that may reside in the memory 236.

As is further seen in Figure 2, the application programs 254 may include a product identification (ID) acquisition module 260 and/or a batch status acquisition

30   module 265. The product ID acquisition module 260 may carry out the operations described herein for obtaining a product identification string, such as bar code

information, from a product label, such as a UPC bar code label or RF tag (i.e., a radio frequency transmitter attached to the product that transmits the product identification string), using the scanner **232**. Thus, the product ID acquisition module **260** alone or in combination with a component of the data **256** provides a

5   means for maintaining a record of product identification strings associated with products of a user. As will be described further herein, the product identification strings are associated with a corresponding batch of the product as contrasted with the prior art UPC labels, which are typically simply associated with a brand and/or model of a product without distinction between batches of that brand and/or model

10   of product.

The batch status acquisition module **265** may carry out the operations described herein for transmitting a batch status request to a directory service at selected intervals and/or responsive to a user request and for receiving the requested batch status information responsive to the request. Thus, the system **200**,

15   including the modules **260** and **265** and the scanner **232** provide a consumer appliance including a scanner **232** configured to obtain a product identification string from a product and a controller **236, 238** configured to determine batch status information for a scanned product based on the obtained product identification string. The controller **236, 238** may be configured to repeatedly

20   verify batch status information for a scanned product.

As illustrated in **Figure 2**, the data **256** includes product ID data **270**. The product ID data **270** may be used to maintain product identification strings associated with products of a user. A product identification string, in some embodiments of the present invention, is maintained only temporarily in the

25   product ID data **270** while transmitting a batch status request. In other embodiments, the product ID data **270** may maintain a plurality of records of product identification strings associated with a plurality of products of the user and the controller **236, 238** may be configured to determine batch status information for the plurality of products of the user based on the product identification strings at

30   designated times/intervals.

While the present invention is illustrated, for example, with reference to the product ID acquisition module **260** being an application program in **Figure 2**, as will be appreciated by those of skill in the art, other configurations may also be utilized while still benefitting from the teachings of the present invention. For

5   example, the product ID acquisition module **260** may also be incorporated into the operating system **252,** the I/O device drivers **258** or other such logical division of the data processing system **200**. Thus, the present invention should not be construed as limited to the configuration of **Figure 2** but is intended to encompass any configuration capable of carrying out the operations described herein.

10   The scanner **232** is coupled to the processor **238** over the bus **210.** While the present invention is generally discussed herein by reference to bar code labels, it is to be understood that other types of machine readable identifications on a product are also encompassed within the scope of the present invention, for example, magnetically encoded labels, such as magnetic ink character recognition

15   (MICR) coding. Accordingly, the term "scanner" as used herein is not limited to a particular type of optical and/or magnetic reader, radio frequency (RF) receiver and the like and is intended to encompass any input device configured to obtain identification information from a product.

Figure 3 is a block diagram of a directory service system for

20   communicating product status information according to some embodiments of the present invention. The processor **338** communicates with the memory **336** via an address/data bus **305**. The processor **338** can be any commercially available or custom microprocessor. The memory **336** is representative of the overall hierarchy of memory devices containing the software and data used to implement the

25   functionality of the data processing system **300**. The memory **336** can include, but is not limited to, the following types of devices: cache, ROM, PROM, EPROM, EEPROM, flash memory, SRAM, and DRAM.

As shown in **Figure 3**, the memory **336** may include several categories of software and data used in the data processing system **300**: the operating system

30   **352**; the application programs **354**; the input/output (I/O) device drivers **358**; and the directory service **356**. As will be appreciated by those of skill in the art, the

operating system **352** may be any operating system suitable for use with a data processing system, such as OS/2, AIX or System390 from International Business Machines Corporation, Armonk, NY, Windows95, Windows98, Windows2000 or WindowsXP from Microsoft Corporation, Redmond, WA, Unix or Linux. The I/O

5   device drivers **358** typically include software routines accessed through the operating system **352** by the application programs **354** to communicate with devices such as the I/O data port(s) **46** and certain memory **336** components. The application programs **354** are illustrative of the programs that implement the various features of the data processing system **300** and preferably include at least

10   one application which supports operations according to embodiments of the present invention. Finally, the directory service **356** may be found in the memory **336** of the data processing system **300** and/or may be a remotely located and maintained in data base or data bases accessible to the data processing system, for example, over the Internet. It will be understood that the memory **336** may include additional data

15   used by the application programs **354**, the operating system **352**, the I/O device drivers **358**, and other software programs that may reside in the memory **336**.

As is further seen in **Figure 3**, the application programs **354** may include a request processing module **360** and/or a directory services query module **365**. The request processing module **360** may carry out the operations described herein for

20   receiving from a requestor a batch status request including a product identification string associated with a product of a user. The product identification string is associated with a corresponding batch of the product and the batch status request may include no personal information of the user. The request processing module **360** may also carry out the operations described herein for transmitting the

25   obtained batch status information for the product to the requestor. As shown in **Figure 3**, the processor **338** is coupled to a network interface **346** over a bus **310** and the network interface may be used to receive batch status requests and transmit batch status information replies, for example, over the Internet. The network interface **346** may also be used to access remote directory service(s) where the

30   needed status information is not available locally in the directory service **356**.

Also shown in the application programs **354** of **Figure 3** is a directory services queries module **365**. The directory service queries module **365** may carry out the operations described herein for querying a directory service **356**, including a plurality of records associating product identification strings with batch

5   identifications for corresponding products, to obtain requested batch status information. A product type has a plurality of associated product identification strings associated with different batches of the product type. The corresponding products are provided with a machine readable label including an associated one of the product identification strings.

10   As noted above, the directory service **356** includes a plurality of records associating product identification strings with batch identifications for corresponding products, wherein a product type has a plurality of associated product identification strings associated with different batches of the product type. The product identification strings may be, for example, bar code values. The

15   records of the directory service **356** may further include status information associated with the different batches and the directory service is coupled through the buses **305, 310** to the network interface **346** by the modules **360, 365** to provide an input interface configured to receive a batch status request from a user and to provide the status information to the user responsive to the received batch status

20   request. The directory service **356** may include records for products from different vendors. Alternatively, the records may be associated with products of a single vendor.

While the present invention is illustrated, for example, with reference to the request processing module **360** being an application program in **Figure 3**, as will

25   be appreciated by those of skill in the art, other configurations may also be utilized while still benefitting from the teachings of the present invention. For example, the request processing module **360** may also be incorporated into the operating system **352**, the I/O device drivers **358** or other such logical division of the data processing system **300**. Thus, the present invention should not be construed as

30   limited to the configuration of **Figure 3** but is intended to encompass any configuration capable of carrying out the operations described herein.

While embodiments of the present invention are described herein with reference to particular systems illustrated in **Figures 1-3**, the present invention should not be construed as limited to such systems. Thus, for example, embodiments of the present invention may be provided in a stand-alone

5   application, as part of a consumer appliance or as part of a directory service system. Accordingly, the present invention should not be construed as limited to a particular system configuration but may be utilized in any system capable of carrying out the operations described herein.

Operations according to embodiments of the present invention will now be

10   described with reference to the flowcharts of **Figures 4** through **8**. **Figure 4** is a flowchart illustrating operations that may be carried out according to some embodiments of the present invention for communicating product status information. As shown in **Figure 4**, operations related to communicating product status information may begin by scanning a product label of the product to obtain a

15   product identification string (**Block 400**). As used herein, "scanning" includes receiving wireless transmission of the product identification string, for example, from an RF tag transmitting such information as well as optical reading, magnetic reading and the like. A record of the product identification string associated with the product of the user is maintained (**Block 405**). As noted above and will be

20   discussed further herein, the product identification string is associated with the corresponding batch of the product, not just the product brand and/or model. Operations at **Block 405** may include merely maintaining a temporary record of the product identification string while transmitting a batch status request (as will be described with reference to **Block 410**). In alternative embodiments of the present

25   invention, a plurality of records with product identification strings associated with different products of the user are maintained at **Block 405**.

The batch status request is transmitted to a directory service maintaining batch status information (**Block 410**). A batch status request may be transmitted at selected intervals and/or responsive to a user request. For example, the batch

30   status request for a product identification string may be transmitted responsive to scanning of the product label at **Block 400**. To protect the privacy of a user, the

batch status request transmitted at **Block 410** may include no personal information of the user. Thus, the batch status request may include minimal identification information allowing the directory service to route the responsive batch status information to the correct requesting user. Furthermore, additional protection of

5   the privacy of the user may be provided by use of a registered intermediary that is trusted by the user so that not even an address of the user need be provided to the directory service maintaining the batch status information.

The requested batch status information for the product is received (**Block 415**). For example, the information may be received over an internet connection to

10   a consumer appliance maintained by the user requesting the batch status information. The requested batch status information may then be communicated to the user (**Block 420**). For example, the batch status information may indicate a recall of the product and the user may be notified of the recall at **Block 420**. In other embodiments, the batch status information may indicate that a "Use By" or

15   other expiration date has passed and the product should no longer be used.

The directory service receiving the batch status request and providing the batch status information responsive to the request may be a plurality of sources maintained by different respective manufacturers. In other embodiments of the present invention, a trusted entity is utilized to provide the requested batch status

20   information responsive to the batch status request transmitted to the trusted entity. In such embodiments, a user may register with the trusted entity and batch status requests for products of different manufacturers may be sent to the trusted entity with the requested batch status information provided to the user by the trusted entity. By way of example, a consumer organization, such as Consumer Reports,

25   may operate the directory service containing the batch information cross referenced to product identification strings and may gather recall information from a variety of different manufacturers to maintain an up to date directory service database of products status information.

To further provide secure communication and verification of product status

30   information, the received batch status information may include a certification of the trusted entity. Furthermore, the received batch status information may also

include a signature of an inspecting authority generating the batch status information. Either such certification or signature may provide assurances to the user of the reliability of the received batch status information. Similarly, where different entities maintain directory service databases for different products, the received batch status information from respective ones of the different entities may also include a certification of the different entities to provide assurance of the veracity of the received information and may likewise include signatures of an inspecting authority generating the batch status information.

Referring now to **Figure 5**, operations for further embodiments of the present invention utilizing a consumer appliance for communicating product status information to a user will now be described. Operations begin at **Block 500** when the product label is scanned at the consumer appliance. The consumer appliance may be an integrated unit including both the scanning capability and another consumer function, such as a cooking device or food storage device. Alternatively, a separate scanning device, which may be coupled to one or more consumer appliances, may be provided or the consumer appliance may be an information appliance including memory and program capabilities operatively coupled to a scanner interface. According to embodiments illustrated in **Figure 5**, the consumer appliance, either locally or remotely, maintains a record of product identification strings associated with one or more products of the user (**Block 505**).

Figure 5 particularly illustrates embodiments of the present invention including a consumer appliance that maintains recall information for a product. For example, the consumer appliance may be a cooking appliance and it may be desirable to prevent a user from attempting to prepare a recalled food product without the necessity of querying a directory service each time a user attempts to place a product in the cooking appliance. Accordingly, as shown at **Block 507** of **Figure 5**, the consumer appliance determines if there is a known recall of the scanned product. If there is no record of a known recall (**Block 507**), a batch status request is sent to discover if there have been any recalls for the product (**Block 510**). The batch status information for the product is received responsive to the batch status request (**Block 515**). If the batch status information indicates a recall

(**Block 517**), the user is notified of the recall (**Block 520**). The recall information is maintained as a record of the recall at the consumer appliance (**Block 525**). The record maintained at **Block 525** is then available for detection at **Block 507**.

If a known recall is already of record for the product (**Block 507**), the user

5   is notified of the recall (**Block 530**). In some embodiments of the present invention where a recall affects the product, the consumer appliance may have its operations controlled based on the existence of the recall (**Block 535**). Thus, for example, a product label may be scanned if a user attempts to cook the product in the cooking appliance and a user of the cooking appliance may be notified of a

10   recall if a user attempts to cook a recalled product in the cooking appliance. Furthermore, the cooking appliance, in some embodiments, is controlled to prevent the user from being able to cook a recalled product. Similarly, the consumer appliance may be a food storage appliance and a user may be notified of recalls at the time the user attempts to store a recalled product in the food storage appliance.

15   Further embodiments of the present invention will now be described with reference to the flow chart diagram of **Figure 6**. **Figure 6** illustrates operations for communicating product status information using labeled sales receipts according to some embodiments of the present invention. Operations begin at **Block 600** by scanning a plurality of machine readable labels associated with products of a user

20   at a purchase location. A sales receipt including a machine readable label configured to allow retrieval of the product identification strings for the scanned plurality of machine readable labels is generated (**Block 605**). The machine readable label of the sales receipt is subsequently scanned by a user to obtain the product identification strings for the scanned plurality of machine readable labels

25   (**Block 610**). It is then determined, for example, using embodiments of the present invention as described previously with reference to **Figure 4** and **Figure 5**, if any product recalls affect any of the product batches identified by the product identification strings (**Block 615**). The user is then notified of any such recalls (**Block 620**).

30   Further embodiments of the present invention will now be described with reference to **Figure 7**. **Figure 7** is a flow chart illustrating operations for

communicating product status information using brand loyalty cards and/or bank cards according some embodiments of the present invention. Brand loyalty cards as used herein refers to identification cards commonly used by various retailers and/or wholesalers such as grocery stores, discount warehouses, hardware stores

5 and the like. Bank cards as used herein refers to credit and/or debit cards that may be provided by banks and/or other organizations having financing operations, such as auto companies or retailers. In other words, as used herein, the term "bank cards" is not limited to cards issued by entities characterized as banks by the regulations of any country but is intended to encompass any organization providing

10 credit and/or debit processing services based on a card or other machine readable device utilized by the consumer.

Operations begin at **Block 700** by scanning a user brand loyalty card and/or bank card at a purchase location. A plurality of machine readable labels associated with products of the user are also scanned at the purchase location (**Block 705**).

15 The product identification strings for the scanned plurality of machine readable labels are associated with the scanned user brand loyalty card and/or bank card to allow retrieval of the product identification strings for the scanned plurality of machine readable labels (**Block 710**).

If a brand loyalty card was scanned at **Block 700 (Block 715)**, a user

20 subsequently scans the user brand loyalty card to obtain the product identification strings for the scanned plurality of machine readable labels and maintains a record including the obtained product identification strings (**Block 720**). A user may then determine any recalls or other batch status information for the obtained product identification strings (**Block 735**). If a bank card was scanned at **Block 700 (Block**

25 **725)**, the product identification strings of the scanned plurality of machine readable labels are obtained from the provider of the bank card and the record of the obtained product identification strings is maintained (**Block 730**). A user may then determine any recalls or other batch status information for products associated with the product identification strings obtained from the provider of the bank card

30 (**Block 735**). A user may then be notified of any batch status information, such as recalls (**Block 740**).

Operations for further embodiments of the present invention from the perspective of the directory service will now be described with reference to **Figure 8**. **Figure 8** is a flowchart illustrating operations for communicating product status information using a directory service according to some embodiments of the

5 present invention. Operations begin at **Block 800** with receipt from a requestor of a batch status request including a product identification string associated with the product of the user. As noted previously, the product identification string is associated with the corresponding batch of the product, not simply the brand and/or model of the product. The batch status request need include no personal

10 information of the user. A directory service including a plurality of records associating product information strings with batch identifications for corresponding products is queried to obtain to the requested batch status information (**Block 805**). The obtained batch status information for the product is transmitted to the requestor (**Block 810**).

15 As described above, extending the information associated with the product identification string, such as a UPC bar-code label, to include a batch number provides for novel systems methods and computer program products for communicating product status information that may allow personal information of a user to be maintained in a more confidential manner than with conventional

20 product registration techniques while still providing more reliable notification of recalls and other such product information than mass market communications. For example, a microwave oven could, via push technology or programmed replication, periodically obtain recall information about food products. If a batch of beef was determined to have e-coli, consumers could scan the food, with or without the

25 intention of using the microwave to prepare it, and be assured that there is no current recall on that batch of beef. Furthermore, a microwave oven can be provided that remembers batch information to warn users prior to consumption or after consumption of any such recall event.

The benefits of the present invention can be provided to consumer goods

30 beyond food products. For example, concerned parents could retain and swipe their car seat UPC labels periodically to determine if any recall has occurred.

Alternatively, various products could be scanned and registered, for example, at the time of purchase, in a microwave or other information appliance to allow detection of a recall at a scheduled interval or otherwise determined future time without the need to continuously re-scan the bar code to trigger checking product status.

5   In addition a grocery store or other retailer could generate store receipts containing machine readable codes that may be used to proactively retrieve all information on purchased items for proactive notification. Likewise, a user's branded loyalty card can be scanned to avoid the need for generation and scanning of sales receipts. Similarly, credit card companies could generate repositories of

10   this purchase information on behalf of the consumer.

Associated directory services containing the necessary product status information may be provided by and/or for suppliers, distributors, manufacturers and/or retailers either by these companies or by some other trusted entity. Certification of the information may be provided to avoid communication of false

15   information, which could lead to consumer scares on product recalls. The inspecting authorities may also provide an electronic signature to information on batches to further assure the veracity of the provided batch information. Services in accordance with the present invention may be provided for a fee by various providers and/or in exchange for receiving batch and/or individual item numbers

20   by the retailers and/or manufactures.

The flowcharts and block diagrams of **Figures 1** through **8** illustrate the architecture, functionality, and operation of possible implementations of systems, methods and computer program products for communicating product status information according to various embodiments of the present invention. In this

25   regard, each block in the flow charts or block diagrams may represent a module, segment, or portion of code, which comprises one or more executable instructions for implementing the specified logical function(s). It should also be noted that, in some alternative implementations, the functions noted in the blocks may occur out of the order noted in the figures. For example, two blocks shown in succession

30   may, in fact, be executed substantially concurrently, or the blocks may sometimes be executed in the reverse order, depending upon the functionality involved. It will

also be understood that each block of the block diagrams and/or flowchart illustrations, and combinations of blocks in the block diagrams and/or flowchart illustrations, can be implemented by special purpose hardware-based systems which perform the specified functions or acts, or combinations of special purpose

5   hardware and computer instructions.

In the drawings and specification, there have been disclosed typical illustrative embodiments of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being set forth in the following

10   claims.